Family-Oriented Cardiac Risk Estimator: A Java Web-Based Applet

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We developed a Java applet that calculates four different estimates of a person's 10-year risk for heart attack:
(1) Estimate based on Framingham equation
(2) Framingham equation estimate modified by C-reactive protein (CRP) level
(3) Framingham estimate modified by family history of heart disease in parents or siblings
(4) Framingham estimate modified by both CRP and family heart disease history
This web-based, family-oriented cardiac risk estimator uniquely considers family history and CRP while estimating risk.

INTRODUCTION

Current guidelines from the Adult Treatment Panel III of the National Cholesterol Education Program require estimating 10-year risk for a coronary heart disease (CHD) event for those with two or more risk factors, but without known CHD or an equivalent[1,2]. Numerous computerized CHD risk estimators are now on the internet. Some are downloadable for personal use. But none of these quantify family history or include C-reactive protein. This Java applet is a new cardiac risk estimator that combines the CHD risk estimate calculated with Framingham equations[3] with the relative risk of a new risk factor (C-reactive protein) and of family history of CHD. Previous structure and function analyses of a spreadsheet prototype risk estimator confirmed its validity for hypothetical extreme cases and actual patients.

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METHOD

Based on the previous spreadsheet prototype, interface components were identified. A graphical user interface in Java applet was developed based on those components. The interface design has two separate panels, one for Framingham's equation and other for family history. To improve usability, the drop-down combo box components were used wherever possible for data collection. In the backend, the risk estimates are calculated using Framingham's equation, and family history modification.

DISCUSSION

The family-oriented cardiac risk estimator is designed to elicit CHD risk factor data and calculates individual's 10-year risk for CHD using Framingham Equation. It also elicits C-reactive protein status and combines its relative risk with Framingham risk.
The applet further elicits family heart disease history, estimates the relative risk of an individual's family history and combines Framingham risk with the relative risk of family history to calculate a second adjusted risk estimate. It combines relative risk of C-reactive protein and family history with Framingham risk to calculate an overall risk estimate.
The applet can have database connectivity to record user activity. This user data could be used later for research, educational, or publication purposes.

FUTURE DIRECTION

Our system is initially an independent applet. We would like to eventually join it with textual and graphic instructional information about cholesterol medicine to form an integrated decision support system for patients considering whether to take cholesterol medicine.

References

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